

# BEST AVAILABLE COPY

This listing of claims will replace all prior versions, and listings, of claims in the application:

## LISTING OF THE CLAIMS

Claim 1. (Currently amended): A precursor source mixture utilized for chemical vapor deposition or atomic layer deposition comprising at least one precursor compound which is dissolved, emulsified or suspended in an inert organic liquid, where said precursor compound is a precursor metal atom bound to a ligand selected from the group consisting of hydride, carbonyl, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, siloxy, and silyl, with the proviso that the precursor compound is not an alkylamine alane,  $\text{MeAu}(\text{PMe}_3)$ , or  $(\text{Me}_3\text{P})\text{Cu}(\text{tert}butoxy)$ , tantalum cyclopentadienyl hydride,  $(\text{C}_5\text{H}_5)\text{Ru}(\text{CO})_3$ , copper bound to a  $\beta$ -diketonate,  $\beta$ -diiminate,  $\beta$ -diketiminate, and the proviso that the precursor compound is not bound to a diketoamido  $(\text{RC}(\text{O})\text{NC}(\text{O})\text{CR})$ , imidoylamidinato  $(\text{RC}(\text{NH})\text{NC}(\text{NH})\text{CR})$ , ketimidoylamidinato  $\text{RC}(\text{O})\text{NC}(\text{NH})\text{CR}$ , or hydrocarbyl  $\text{C}(\text{R}_2)\text{C}(\text{CH}_3)_2\text{C}(\text{R}_2)\text{N}(\text{R}_2)$  ligand, wherein R is a hydrocarbon and the proviso that the precursor metal atom is not Pt.

Claim 2. (Previously presented): The precursor source mixture of Claim 1 wherein said inert organic liquid is an aliphatic hydrocarbon, aromatic hydrocarbon, alcohol, ether, aldehyde, ketone, acid, phenol, ester, alkyl nitrile, halogenated hydrocarbon, silyated hydrocarbon, thioether, amine, cyanate, isocyanate, thiocyanate, silicone oil, nitroalkyl, alkyl nitrate, or mixtures thereof.

Claim 3. (Canceled)

Claim 4. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi;  $\text{R}^1$  is a  $\text{C}_1$ - $\text{C}_8$  alkyl, or  $\text{C}_4$ - $\text{C}_{12}$  cycloalkyl;  $\text{R}^2$  is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, or

halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 5. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi; R<sup>1</sup> is a C<sub>2</sub>-C<sub>8</sub> alkenyl, C<sub>4</sub>-C<sub>12</sub> cycloalkenyl or C<sub>5</sub>-C<sub>18</sub> aryl; R<sup>2</sup> is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 6. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi; R<sup>1</sup> is a carbonyl; R<sup>2</sup> is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 7. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi; R<sup>1</sup> is an alkoxy or siloxy; R<sup>2</sup> is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl; amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine,

stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 8. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi;  $R^1$  is an amide;  $R^2$  is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated and sulfonated or silylated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 9. (Withdrawn): The precursor source mixture of Claim 1 wherein the precursor compound has the formula  $MR^1_x(PR^2_3)_yA_z$  where M is Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag or Au,  $R^1$  and  $R^2$  is a ligand selected from the group consisting of hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated, sulfonated or silylated derivatives thereof; A is an optional coordinatively bound ligand selected from the group consisting of phosphines, phosphites, aryls, amines, arsines, stibenes, ethers, sulfides, nitriles, isonitriles, alkenes, alkynes, hydrazine, pyridines, nitrogen heterocycles, macrocycles, schiff bases, cycloalkenes, alcohols, phosphine oxides, alkylidenes, nitrites and water;  $x \geq 1$ ;  $y \geq 0$ ;  $z \geq 0$ ; and  $x+y =$  the valence of M.

Claim 10. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Mg, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pa, U, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi;  $R^1$  is a nitrate;  $R^2$  is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitryl, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, or halogenated, sulfonated or silylated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile,

isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite, or water.

Claim 11. (Withdrawn): The precursor source mixture of Claim 1 wherein M is Li, Na, K, Rb, Cs, Fr, Be, Mg, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pa, U Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi; R<sup>1</sup> is a halide; R<sup>2</sup> is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitril, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, or halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycle, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite or water.

Claim 12. (Withdrawn): The precursor source mixture of Claim 1 wherein M Li, Na, K, Rb, Cs, Fr, Be, Mg, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pa, U Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb or Bi; R<sup>1</sup> is a silyl; R<sup>2</sup> is a hydride, alkyl, alkenyl, cycloalkenyl, aryl, alkyne, carbonyl, amido, imido, hydrazido, phosphido, nitrosyl, nitril, nitrate, nitrile, halide, azide, alkoxy, siloxy, silyl, and/or halogenated, sulfonated or silyated derivatives thereof; and A is a phosphine, phosphite, aryl, amine, arsine, stibene, ether, sulfide, nitrile, isonitrile, alkene, alkyne, hydrazine, pyridine, nitrogen heterocycle, macrocycles, schiff base, cycloalkene, alcohol, phosphine oxide, alkylidene, nitrite or water.

Claim 13. (Canceled)

Claim 14. (Previously presented): The precursor source mixture of Claim 1 wherein said inert organic liquid vaporizes at a higher temperature than said at least one precursor compound.

Claim 15. (Previously presented): The precursor source mixture of Claim 2 wherein said inert organic liquid is a C<sub>5-12</sub> alkane.

Claim 16. (Previously presented): The precursor source mixture of Claim 1 wherein said inert organic liquid contains an additive of no more than 30% by volume of the inert organic liquid.

Claim 17. (Original): The precursor source mixture of Claim 16 wherein said additive is an additional precursor ligand, an additional precursor adduct, or other coordinating compound selected from the group consisting of phosphines, phosphites, aryls, amines, arsines, stibenes, ethers, sulfides, nitriles, isonitriles, alkenes, pyridines, heterocycles, tetrahydrofuran, dimethylformamide, macrocycles, schiff bases, cycloalkenes, alcohols, phosphine oxides and alkynes.

Claim 18. (Previously presented): The precursor source mixture of Claim 16 wherein the additive is selected from the group consisting of methanol, ethanol, isopropanol, neopentanol, trimethylamine, dimethylethylamine, diethylmethylamine, triethylamine, dimethylamine, diethylamine, bistrimethylsilylamine, ammonia, ethylenediamine, propylenediamine, trimethylethylethylenediamine, triphenylphosphine, triethylphosphine, trimethylphosphine, allyl, cyclopentadiene, benzene, ethylbenzene, toluene, cyclohexadiene, cyclooctadiene, cycloheptatriene, cyclooctatetraene, mesitylene, tetrahydrofuran, dimethylformamide, dimethylsulfoxide, butyl acetate, acetic acid, ethylhexanoic acid, methane, ethane, pyridine, and  $\text{PF}_3$ .

Claim 19. (Previously presented): The precursor source mixture of Claim 1 wherein the inert organic liquid is composed of two or more components selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, alcohols, ethers, aldehydes, ketones, acids, phenols, esters, amines, alkyl nitrile, halogenated hydrocarbons, silylated hydrocarbons, thioethers, amines, cyanates, isocyanates, thiocyanates, silicone oils, nitroalkyl, alkyl nitrate, and/or mixtures of one or more of the above and an additive of no more than 30% by volume of the inert organic liquid wherein the additive is selected from the group consisting of additional precursor ligand, additional precursor adduct, and other coordinating compound selected from the group consisting of phosphines, phosphites, aryls, amines, arsines, stibenes, ethers, sulfides, nitriles, isonitriles,

alkenes, pyridines, heterocycles, tetrahydrofuran, dimethylformamide, macrocycles, schiff bases, cycloalkenes, alcohols, phosphine oxides, and alkynes.

Claim 20. (Previously presented): The precursor source mixture of Claim 19 wherein the additive is selected from the group consisting of methanol, ethanol, isopropanol, neopentanol, trimethylamine, dimethylethylamine, diethylmethylamine, triethylamine, dimethylamine, diethylamine, bistrimethylsilylamine, ammonia, ethylenediamine, propylenediamine, trimethylethylenediamine, triphenylphosphine, triethylphosphine, trimethylphosphine, allyl, cyclopentadiene, benzene, ethylbenzene, toluene, cyclohexadiene, cyclooctadiene, cycloheptatriene, cyclooctatetraene, mesitylene, tetrahydrofuran, dimethylformamide, dimethylsulfoxide, butyl acetate, acetic acid, ethylhexanoic acid, methane, ethane, pyridine, and  $\text{PF}_3$ .

Claim 21. (Previously presented): The precursor source mixture of Claim 1 wherein the inert organic liquid is composed of  $\text{C}_5$ - $\text{C}_{12}$  alkane and contains an additive of no more than 30% by volume of the inert organic liquid wherein the additive is selected from the group consisting of an additional precursor ligand, an additional precursor adduct, or other coordinating compound selected from the group consisting of phosphines, phosphites, aryls, amines, arsines, stibenes, ethers, sulfides, nitriles, isonitriles, alkenes, pyridines, heterocycles, tetrahydrofuran, dimethylformamide, macrocycles, schiff bases, cycloalkenes, alcohols, phosphine oxides, and alkynes.

Claim 22. (Previously presented): The precursor source mixture of Claim 21 wherein the additive is methanol, ethanol, isopropanol, neopentanol, trimethylamine, dimethylethylamine, diethylmethylamine, triethylamine, dimethylamine, diethylamine, bistrimethylsilylamine, ammonia, ethylenediamine, propylenediamine, trimethylethylenediamine, triphenylphosphine, triethylphosphine, trimethylphosphine, allyl, cyclopentadiene, benzene, ethylbenzene, toluene, cyclohexadiene, cyclooctadiene, cycloheptatriene, cyclooctatetraene, mesitylene, tetrahydrofuran, dimethylformamide, dimethylsulfoxide, butyl acetate, acetic acid, ethylhexanoic acid, methane, ethane, pyridine, or  $\text{PF}_3$ .

Claim 23. (Canceled)

Claim 24. (Original): A method for chemical vapor deposition or atomic layer deposition comprising: vaporizing the precursor compound in the precursor source mixture of Claim 1, introducing the vaporized precursor into a chemical vapor deposition or atomic layer deposition reactor with optional addition of other co-reactant(s), and depositing a constituent of the vaporized precursor on a substrate to form a film.

Claim 25. (Original): The method of Claim 24 wherein said film is a component in an electronic device.

Claim 26. (Original): The method of Claim 24 wherein said co-reactant(s) is introduced separately from said vaporized precursor.

Claim 27. (Original): The method of Claim 24 comprising vaporizing the precursor in the precursor source mixture, and introducing the vaporized precursor into an atomic layer deposition reactor with separate addition of other co-reactant(s) and inert purge gas and depositing a film on a substrate by sequential introduction of alternating pulses of vaporized precursor(s), purge gas, co-reactant(s) and purge gas.

Claim 28. (Original): The method of Claim 24 wherein the co-reactant is a reducing agent, an oxidizing agent, a nitriding agent or a silyating agent.

Claim 29. (Previously presented): The method of Claim 28 wherein said co-reactant is a reducing agent selected from the group consisting of hydrogen, forming gas, silane, and combinations thereof.

Claim 30. (Previously presented): The method of Claim 28 wherein said co-reactant is an oxidizing agent selected from the group consisting of oxygen, ozone, water, hydrogen peroxide, nitrous oxide, and combinations thereof.

Claim 31. (Previously presented): The method of Claim 28 wherein said co-reactant is a nitriding agent selected from the group consisting of ammonia, hydrazine, hydrogen azide, tertbutylamine, isopropylamine, and combinations thereof.

Claim 32. (Previously presented): The method of Claim 28 wherein said co-reactant is a silyating agent selected from the group consisting of silane, disilanes, chlorosilanes, silylamines, silazanes, and combinations thereof.

Claim 33. (Original): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of three or more different gases wherein one of said gases comprises vaporized precursor of said precursor source mixture, another of said gases is a purge gas and another of said gases is a reducing agent.

Claim 34. (Original): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of three or more different gases wherein one of said gases comprising said vaporized precursor of said precursor source mixture, another of said gases is a purge gas and another of said gases is an nitriding agent.

Claim 35. (Previously presented): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of four or more different gases, wherein one of said gases comprises said vaporized precursor of said precursor source mixture, another of said gases is a purge gas, another of said gases is an oxidizing agent and another of said gases is selected from the group consisting of any vaporized precursor and a vaporized precursor of said precursor source mixture.



Claim 36. (Previously presented): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of four or more different gases, wherein one of said gases comprises vaporized precursor of said precursor source mixture, another of said gases is a purge gas, another of said gases is a nitriding agent and another of said gases is selected from the group consisting of any vaporized precursor and a vaporized precursor of said precursor source mixture.

Claim 37. (Previously presented): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of four or more different gases, wherein one of said gases comprises vaporized precursor of said precursor source mixture, another of said gases is a purge gas, another of said gases is a reducing agent and another of said gases is selected from the group consisting of any vaporized precursor and a vaporized precursor of said precursor source mixture.

Claim 38. (Currently amended): The method of Claim 24 comprising subjecting said substrate to a sequence of alternating pulses of five or more different gases, wherein one of said gases comprises vaporized precursor of said precursor source mixture, another of said gases is a purge gas, another of said gases is a reducing agent and another of said gases is selected from the group consisting of any Si containing vaporized precursor and a Si containing vaporized precursor of said precursor source mixture.

Claim 39. (Original): The method of Claim 24 wherein the substrate is selected from the group consisting of semiconductor substrates, dielectrics, metals, organic substrates, glasses, metal oxides, and plastic polymeric substrates, Si-containing semiconductor substrates, ceramics, silicon-on- insulator substrates, Ge substrates, SiGe substrates, GaAs substrates, and mixtures or multilayers thereof.

Claim 40. (Original): The method of Claim 25 wherein said electronic device is a transistor, capacitor, diode, resistor, switch, light emitting diode, laser, wiring structure, or interconnect structure.

Claim 41. (Original): A method of fabricating a stack or trench capacitor structure composed of a bottom electrode, a dielectric layer, a top electrode layer and an optional dielectric buffer layer over said capacitor which is connected to underlying circuitry via a plug and optional barrier wherein at least one component of the capacitor structure is deposited according to Claim 24.

Claim 42. (Original): The method of Claim 41 wherein the optional dielectric barrier is selected from the group consisting of  $\text{SiO}_2$ ,  $\text{SiO}_x\text{N}_y$ ,  $\text{Si}_3\text{N}_4$ ,  $\text{TiON}$ ,  $\text{AlN}$ ,  $\text{SiN}$ ,  $\text{TiN}$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{HfO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$ , alloys, mixtures or layers thereof, and multicomponent metal oxides.

Claim 43. (Original): The method of Claim 41 wherein the dielectric is a ferroelectric material.

Claim 44. (Original): The method of Claim 41 wherein the plug material is selected from the group consisting of polysilicon, W, Mo, Ti, Cr, Cu, and doped or undoped alloys, mixtures and multilayers thereof.

Claim 45. (Previously presented): The method of Claim 41 wherein the conductive barrier is selected from the group consisting of  $\text{TaN}$ ,  $\text{TaSiN}$ ,  $\text{TiAlN}$ ,  $\text{TiSiN}$ ,  $\text{TaWN}$ ,  $\text{TiWN}$ ,  $\text{NbN}$ ,  $\text{ZrN}$ ,  $\text{TaTiN}$ ,  $\text{IrOx}$ ,  $\text{Os}$ ,  $\text{OsOx}$ ,  $\text{MoSi}$ ,  $\text{TiSi}$ ,  $\text{ReO}_2$ , and doped or undoped alloys, mixtures and multilayers thereof.

Claim 46. (Original): The method of Claim 41 wherein the bottom electrode is selected from the group consisting of conductive materials, polysilicon, Ni, Pd, Pt, Cu, Ag, Au, Ru, Ir, Rh,  $\text{OsOx}$ ,  $\text{TaN}$ ,  $\text{TaSiN}$ , Ta,  $\text{SrRuO}_3$ ,  $\text{LaSrCoO}_3$ , and doped or undoped alloys, mixtures and multilayers thereof.

Claim 47. (Original): The method of Claim 41 wherein the dielectric material is selected from the group consisting of  $\text{SiO}_2$ ,  $\text{SiO}_x\text{N}_y$ ,  $\text{Si}_3\text{N}_4$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{HfO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$ , multicomponent metal oxides, perovskite type oxide having the formula  $\text{ABO}_3$  wherein B is at least one acid oxide containing a metal selected from the group consisting of Al, Ti, Zr, Hf, V,

Nb, Ta, Cr, Mo, W and Cu, and A is at least one additional cation having a positive formal charge of from about 1 to about 3, barium strontium titanate, barium strontium zirconate, barium strontium hafnate, lead titanate, yttrium aluminate, lanthanum aluminate, lead zirconium titanate, strontium bismuth tantalate, strontium bismuth niobate, bismuth titanate, lanthanum silicate, yttrium silicate, hafnium silicate, zirconium silicate, rare earth doped silicates and doped or undoped alloys, mixtures and multilayers thereof.

Claim 48. (Original): The method of Claim 41 wherein the top electrode is selected from the group consisting of polysilicon, Ni, Pd, Pt, Cu, Ag, Au, Ru, Ir, Rh, IrOx, TaN, TaSiN, Ta, SrRuO<sub>3</sub>, LaSrCoO<sub>3</sub>, and doped or undoped alloys, mixtures and multilayers thereof.

Claim 49. (Original): A method of fabricating a wiring structure composed of etched trenches and vias into a dielectric layer, optional barrier material between dielectric and wiring material, and wiring material wherein at least one component of the wiring structure is deposited according to Claim 24.

Claim 50. (Original): The method of Claim 49 wherein the dielectric layer is selected from the group consisting of SiO<sub>2</sub>, SiO<sub>x</sub>N<sub>y</sub>, Si<sub>3</sub>N<sub>4</sub>, phosphosilicate glass, metal oxides, Al<sub>2</sub>O<sub>3</sub> and doped or undoped alloys, mixtures and multilayers thereof.

Claim 51. (Original): The method of Claim 49 wherein the optional barrier material is selected from the group consisting of WN, TiN, TaN, SiO<sub>2</sub>, SiO<sub>x</sub>N<sub>y</sub>, Si<sub>3</sub>N<sub>4</sub>, phosphosilicate glass, metal oxides, Al<sub>2</sub>O<sub>3</sub>, and doped or undoped alloys, mixtures and multilayers thereof.

Claim 52. (Original): The method of Claim 49 wherein the wiring material is selected from the group consisting of polysilicon, Al, W, Mo, Ti, Cr, Cu and doped or undoped alloys, mixtures and multilayers thereof.

Claim 53. (Original): A method of fabricating an electronic device composed of a substrate having source and drain regions and a channel region between said source and drain regions, a

gate dielectric, aligned to and on top of said channel region, and a gate electrode aligned to and on top of said gate dielectric wherein at least one component of the electronic device is deposited according to Claim 24.

Claim 54. (Previously presented): A method of Claim 53 wherein the gate dielectric selected from the group consisting of  $\text{SiO}_2$ ,  $\text{SiO}_x\text{N}_y$ ,  $\text{Si}_3\text{N}_4$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{HfO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$ , multicomponent metal oxides, perovskite type oxide having the formula  $\text{ABO}_3$  wherein B is at least one acid oxide containing a metal selected from the group consisting of Al, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W and Cu, and A is at least one additional cation having a positive formal charge of from about 1 to about 3, barium strontium titanate, barium strontium zirconate, barium strontium hafnate, lead titanate, yttrium aluminate, lanthanum aluminate, lead zirconium titanate, strontium bismuth tantalate, strontium bismuth niobate, bismuth titanate, lanthanum silicate, yttrium silicate, hafnium silicate, zirconium silicate, rare earth doped silicates and doped or undoped alloys, mixtures and multilayers thereof.

Claim 55. (Original): The method of Claim 53 wherein gate dielectric is composed of more than one layer.

Claim 56. (Original): The method of Claim 53 wherein the gate electrode is selected from the group consisting of polysilicon, Al, Ag, Bi, Cd, Fe, Ga, Hf, In, Mn, Nb, Y, Zr, Ni, Pt, Be, Ir, Te, Re, Rh, W, Mo, Cr, Fe, Pd, Au, Rh, Ti, Cr, Cu, and doped or undoped alloys, mixtures and multilayers thereof.

Claim 57. (Previously presented): The precursor source mixture of Claim 1 wherein the at least one precursor compound is B, Al, Ga, In, As or Sb, hydride, chloride, fluoride, bromide, iodide, Cp or azide;  $\text{Mo}(\text{CO})_3$ ;  $\text{Fe}(\text{CO})_5$ ;  $\text{Co}_2(\text{CO})_8$ ;  $\text{Os}_3\text{CO}_{12}$ ;  $\text{Cr}(\text{CO})_6$ ;  $\text{Mn}_2(\text{CO})_{10}$ ;  $\text{Mo}(\text{CO})_6$ ;  $\text{Ni}(\text{CO})_4$ ;  $\text{Re}_2(\text{CO})_{10}$ ;  $\text{Ru}_3(\text{CO})_{12}$ ;  $\text{W}(\text{CO})_6$ ;  $\text{CF}_3\text{Co}(\text{CO})_4$ ;  $(\text{CO})_4\text{Fe}[\text{P}(\text{OCH}_3)_3]$ ;  $(\text{CO})_4\text{Fe}[\text{N}(\text{CH}_3)_3]$ ;  $\text{CoNO}(\text{CO})_3$ ;  $\text{OSi}(\text{CH}_3)_3$  Li, Na, K, Rb, Cs, Fr, Cu, Ag, Au, Hg, or Tl; tetra- $\text{OSi}(\text{CH}_3)_3$  Si, Ge, Sn, Pb, Ti, Zr, or Hf; tri- $\text{OSi}(\text{CH}_3)_3$ , B, Al, Ga, In, P, As, or Sb;

diethylaminoarsine dichloride; bisdimethylaminoarsine chloride;  $(\text{CO})_4\text{Fe}[\text{N}(\text{CH}_3)_3]$ , Li, Na, or K  $\text{N}(\text{SiMe}_3)$ ,  $\text{CpCu}(\text{PEt}_3)$ ;  $\text{CpCu}(\text{triphenylphosphine})$ ;  $\text{Ni}(\text{PF}_3)_4$ ;  $\text{Cr}(\text{PF}_3)_6$ ;  $(\text{Et}_3\text{P})_3\text{Mo}(\text{CO})_3$ ;  $\text{Ir}(\text{PF}_3)_4$ ;  $\text{Ti}(\text{NO}_3)_4$ ;  $\text{Zr}(\text{NO}_3)_4$ ;  $\text{Hf}(\text{NO}_3)_4$ ;  $\text{Si}(\text{CH}_3)_3(\text{NO}_3)$ ;  $\text{RuNO}(\text{NO}_3)_3$ ; gallium nitrate;  $\text{Sn}(\text{NO}_3)_4$ ;  $\text{Co}(\text{NO}_3)_3$ ;  $\text{VO}(\text{NO}_3)_3$ ;  $\text{CrO}_2(\text{NO}_3)_2$ ;  $\text{TiCl}_4$ ;  $\text{ZnCl}_2$ ;  $\text{ZrCl}_4$ ;  $\text{HfCl}_4$ ;  $\text{AlCl}_3$ ;  $\text{SiCl}_4$ ;  $\text{GaCl}_3$ ;  $\text{SnCl}_4$ ;  $\text{CoCl}_3$ ;  $\text{N}(\text{SiMe}_3)$  Li, Na, or K;  $\text{B}(\text{CH}_2\text{SiMe}_3)_3$ ;  $(\text{Me}_3\text{SiCH}_2)_4$  Ti, Zr or Hf.

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